symptoms of tuberculosis, a positive reaction followed after Moro's test. Some cases came under treatment that did not have any sputum at all, but other symptoms, as cough, night sweats, fever, loss in weight or hemoptosis. Moro's test was positive and decided the treatment. It is important that the ointment is prepared properly, otherwise the result will be doubtful.

As an illustration I would like to mention a case that Doctor Redmond Payne referred to me. A young woman with cough, expectoration and considerable loss in weight had been operated on by Doctor Payne on account of hypertrophied tonsils. The microscopical examination by Doctor Ophuls showed a tuberculosis of the tonsils. Several examinations of the sputum showed no tubercle bacilli. Doctor Payne tried the Moro test with negative result. He sent the patient to me for examination and I found a suspicious spot in the right upper lobe. I used the ointment and got a decided and quick reaction. The different results were due to the preparation of the ointments.

I have the decided impression that an outspoken reaction is a favorable sign in regard to prognosis. Most patients with far-advanced cases react very lightly or not at all. I cannot say the same of the Calmette reaction. Some writers, for instance Stadelman and Wolff-Eisner believe that a negative Calmette reaction, in definite cases of tuberculosis, is a bad prognostic sign. This cannot be accepted as a general rule. In about 50% of my cases of tuberculosis of the 3rd stage I have seen a negative reaction. Some of these cases grew worse rapidly and died, but some of them showed no ophthalmic reaction and got better. Others show an outspoken reaction and die quickly. The same can be said of the ophthalmic reaction in cases of the second stage. In the cases of the first stage I could not convince myself at all of any prognostic value of the Calmette instillation.

The Pirquet reaction seems to be more valuable in regard to the prognosis, but it is important to use weak solutions. I prefer a 1% solution of Koch's tuberculin in 0.9% normal salt solution, always make a control scratch and then scarify at another place through a drop of the tuberculin solution. If the reaction is outspoken and appears quickly, it seems to be a good prognostic sign and is in this regard similar to the Moro test.

In conclusion of this paper, I would like to state that it seems advisable to use in all cases that appear suspicious of tuberculosis, first the Moro ointment for diagnostic purposes, because it is quick, free from any disagreeable general symptoms, free from any danger, and reliable. If, in a suspicious case, the reaction should be negative, it is advisable to use an injection of tuberculin, either subcutaneously or intravenously,—1-10 of a mgm. intravenously, or 1-3 of a mgm. subcutaneously are sufficient in the majority of cases. The intravenous method is preferable for the reasons stated in the beginning of this paper.

TREATMENT OF BURNS.*

By CHESTER J. TEASS, M. D., Kennett.

My excuse, if any is necessary, for bringing to your attention the treatment of so common a condition as that of burns is due to the very fact of their importance through their frequency. Moreover, the literature upon this subject has been meager during my time of practice and I have yet to hear a paper read or a discussion of this subject before a body of medical men. Furthermore, I know of no condition in the whole category of surgical or medical nomenclature for which the lay public have such an inherent, fiendish abhorrence as for that of "burns." This may be due to that still lingering spark of superstition in the breast of humanity so firmly implanted by the clerical teachings of past ages. This wildly hysterical and fearful mental dread only adds to the physical shock when such accidents are encountered, and in this day of perfected surgical technic, is entirely unwarranted, because the vast majority of this class of patients can be rendered speedily and permanently comfortable.

Having been connected with smelter and railroad work for the past ten years, I have had a rather varied and interesting experience with "Treatment of Burns," and for my own part would much rather have a patient brought into the hospital quite severely burnt than one suffering from pneumonia, typhoid fever, etc.

The indications for treatment are:

1st. To relieve the pain and overcome the shock.

2nd. To prevent infection and thus prolonged sloughing.

3rd. To guard against congestion and inflammation of the internal organs.

Pain is relieved by any of the safe systemic methods at our command for the alleviation of pain and additionally by such local treatment as presently to be described. The first and foremost thing to keep in mind in the local treatment of burns is, that it is at all times essentially a surgical condition; hence it is of paramount importance to see that everything coming into contact with the wound is sterile.

Like gunshot wounds, the first dressings are the all-important ones, and for this reason we keep gallon bottles filled with a 4 per cent aquo-alcoholic solution of picric acid distributed in parts of the smelter where men are most exposed to the danger of burns and have all foremen instructed that when a man is burnt to cover his burnt areas and the clothing in their vicinity with the picric acid or yellow solution and then send him to the hospital without any further dressings being applied to the burnt surface.

We have the picric acid solution used first because it not only relieves the physical and thus the mental suffering, but because it is about the most penetrating and efficient surgical dressing we possess. I have never seen a case of infection follow its first application to burns, neither have I seen a case of poisoning follow its free and prolonged use,

* Read before the Pacific Association of Railway Surgeons, 1908.

although I can conceive that some patients may have an idiosyncrasy for the acid as well as for any drug. If there is a granulating surface it is of little value; but there is another thing you can surely depend upon, and that is, when you have a wound covered with a moist picric acid dressing you need never fear an erysipelatous infection of that wound, for picric acid is a specific for the erysipelatous bacillus. Its only drawback is its property of staining yellow everything with which it comes in contact. In a measure, this objection can be overcome by the attendants wearing rubber gloves, but as the color cannot be detected by artificial light, extra precaution should be taken when using it at night. However, the yellowish discoloration of the skin may be removed by washing with alcohol or with a solution of carbonated lithium, or better still, a solution of ammonia.

Hence, it seems to me that as we possess such an all around, efficient and desirable remedy as picric acid for the first aid in such conditions, that it is our duty to have it in convenient shape for immediate application in all places where humanity congregates and where there is any likelihood to such accidents, for it prevents the kind friends from covering the burnt surfaces with such things as carron oil, lubricating oil or any other kind of oil or grease, or "Denver mud" and the like, which substances only hold the dirt there and thus interfere with the proper surgical cleansing of the wound, as well as being the cause of unnecessary pain.

When the patient is seriously burnt, as soon as he is covered with the picric acid solution, he has a woolen blanket thrown around him and is given a very hot drink, which will equalize the circulation to some extent before reaching the hospital. Here the wound is carefully freed from all foreign substances and the vesications are carefully drained, as their serum plus fibrin-ferment on coagulation forms an excellent culture medium. When large blebs form, the skin is left intact for protection, their lower margin being slightly punctured and their serus contents gently pressed out with a sterile gauze sponge. In the meantime the patient is being treated for shock by such cardinal principles as laid down by Crile of Cleveland. Now, if the burns are very extensive both as to degree and area, he is put into a warm bath where the temperature is aimed to be kept at about 100° F. during the shock and later never allowed to drop below 98½° F. The bath may have 4% boric acid or 1% sodium chloride added to it. According to Rose, the first record found in literature of treatment of burns by the continuous warm water bath is that by Passavant, who treated extensive burns by this method in the year 1857 (first published in 1858); but Hebra in 1861 wrote as follows: "The continuous full bath given for therapeutic purposes and kept up for days, weeks or months, has, as far as I am aware, never been tried or carried out by any one. The action of the continuous bath is manifold. It gives immediate and almost complete relief from pain and can be considered as a most excellent anodyne. Another advantage is that the water penetrates the burnt tissues, in consequence of which they remain moist and soft, they detach themselves easily and are washed away after having become detached. Thus the wound is constantly kept clean and you do away with the awful dread to the patient of changing dressings."

Langenbeck, who in the year 1850 introduced continuous immersion as a method of treating surgical wounds, characterized it as the mildest method, not requiring dressings, securing clean wounds in a way which could not be surpassed in any other method. There are certainly many cases which would prove fatal without the advantage of this means. We know the serious effect of extensive burns on the nervous system, and here the continuous warm bath must be considered as the best of all remedies. When a part of the body is placed in warm water the nerve ends of the skin become irritated. This irritation is transmitted to the vasomotor nerves and is followed by dilatation of the blood vessels and, consequently, by acceleration of the circulation. This accelerated blood circulation facilitates the elimination of the products of inflammation. These warm baths are a means to stimulate metabolism, the principal desideratum when we have to deal with severe injuries needing great recuperative power.

In burns that are less desperate in character we take pads of several thicknesses of plain sterile gauze and wring them out of hot boric acid, acetate of aluminum or normal saline solution, and cover the burns in such a way that only sections of the dressings need be removed at a time. Thus the patient is protected over the greater area of his body all the time. The gauze pads are kept constantly warm and moist by being replaced with new ones at frequent intervals. These moist gauze pads are covered by thick dry pads, made by wrapping absorbent cotton in sterile gauze, and over this is placed a layer of oil silk.

After the stage of shock has been passed and you are assured that none of the internal complications will supervene, the "open air method of treatment" will at times give the speediest and most satisfactory results. Of course, this necessitates a trained nurse in constant attendance, but any severe case of burn should receive such attention. The exudation of serum should be constantly sponged away by means of the sterile gauze sponges and the raw surfaces dusted with stearate of zinc. Again the great advantage of this treatment is that you save the patient the pain and the dread of removing dressings.

Where there has been charring with resulting deep destruction of tissues, it is advisable to dissect out such dead tissue as soon as it is consistent in order to prevent the drain on the system of the slow process of sloughing, as in this way you convert it into a clean surgical wound which can then be treated accordingly; that is, by such methods as the transposing of a flap or resorting to early "skin or egg grafting."

When the papillary layer is involved it can be best protected by rubber tissue in overlapping strips from half an inch to one inch wide, thus allowing

the escape from the wound of discharges which are immediately taken up by the overlying layers of gauze that are nowhere in contact with the wounded surface. The rubber tissue dressing, with its thick covering of sterilized material, acts as a substitute for the destroyed integument. If now the wound has really escaped being infected (which can be prevented by soaking the rubber tissue strips in a saturated solution of gum camphor in phenol), it will rapidly become covered by a renewed epithelial substance. When it is changed there is practically no pain and no hemorrhage whatever. It also prevents exhaustion, and probably eliminates this as a cause of death. Furthermore, there is a small amount of contracture. Where burns of other than an hospital nature are met with, especially of those where self-medication has resulted in inflamed margins, dirty grayish white bases and pouty, flabby red granulations with increased pain, we find that a pad of plain, sterile gauze saturated with a perfectly saturated solution of gum camphor in phenol gives almost magical results. The first dressing will cause some additional burning for about two to five minutes, and then the phenol acts as an anesthetic while the caustic properties are neutralized by the camphor. With this dressing it is surprising how comfortable a patient can remain with relatively large burnt areas while continuing at work. Upon change of dressings the wounds will be found to be surprisingly clean and drying over with considerable degree of rapidity. Especially is the treatment applicable to burns around the ankle and over all bony projections, as with burns in such locations it is more difficult for patients to keep at work.

I have not as yet reached that place in practical surgical results where I have completely discarded all ointments; for instance, where a patient has a rather large superficial burnt area and comes to the office for dressings. A piece of lint covered with sterile zinc ointment will be found one of the most convenient as well as satisfactory drying dressings we possess. Again where there has been numerous small deep burns, and where the edges remain thick and indolent we find the following stimulating ointment to be of value, viz:

℞

Acidi Borici .....3 i
Iodoform .....3 iss
Ichthyol .....3 ii
Zinc Oxide Ointment.....℥ ii

M. ft. Ung.

When the area burned is so extensive that the subsequent suppuration might prove too great a drain upon the patient's strength, and for any reason they could not be advantageously dissected out, or when the area occupies such a position that even if perfect healing should take place, the remaining cicatrix would be constantly exposed to ulceration through the effects of abrasion or would seriously interfere with the use of the limb, it would be advisable to resort to an early amputation.

So far I have spoken of external treatment only, but no article on treatment of burns would be complete without some consideration to internal treatment. In fact, I can conceive of no condition of things that would warrant the neglect of the general consideration and management of every patient as an individual. So in burns of even moderate degree or numerous small burnt areas, the patient's secretory and excretory functions should be carefully watched, the circulation should be kept active in all parts of the body, the diet should be carefully regulated, the bowels should be thoroughly evacuated with repeated doses of calomel and tympany constantly kept down by repeated turpentine emulsion enemas; and for the first few days the patient should be put at absolute rest until the time for dangerous complications shall have passed, such as ulceration of the stomach and bowels (especially the duodenum), nephritis, meningitis, congestion of the lungs, and thrombosis. So we cannot too strongly accentuate the great importance of constitutional treatment.

It has taken some of us a long time to find out that everything that happens to a patient is not solely due to that which is done for him, but also as to the way in which it is done.

I wish to report briefly two cases only as they will illustrate what can be done in some apparently hopeless conditions:

In July, 1900, while in charge of the Iron Mountain Copper Company's Hospital at Keswick, Mr. P. M. was brought into the hospital with his left leg and foot fairly cooked from having endeavored to walk over the crust of a slag pot filled beneath with molten slag, the crust not having cooled sufficiently to sustain his weight, gave way precipitating his foot to the bottom with the result as stated. After the usual preliminary treatment in such cases, and when the foot and leg had become covered with healthy granulations, I curetted down to a healthy base and applied Thiersch's skin grafts, but as the weather was unusually hot I could not get the skin grafts to take, so I resolved to try the so-called egg-grafting, which is as follows, viz: Take a perfectly fresh egg and soak it in bichloride 1-1000 for three hours, then rinse in sterile water, open the shell under aseptic conditions, removing the lining membrane and placing it in normal saline solution. Now apply in the same identical way as the Thiersch graft with its inner and smooth surface next the clean base of the wound. In this case I was amazed at the rapidity with which new, healthy epithelial granulations formed around the islands of egg grafts, for within two weeks the patient's raw area was covered with a healthy epithelial covering, and this when I had seriously considered amputation.

Case No. 2. In December, 1906, Mr. C. C. F., while stooping directly under a blast furnace spout at Mammoth Smelter, at Kennett, had about fifty pounds of molten metal splash over on his head and back, setting his clothes on fire. He ran away from every one, and finally, after being caught, the remnants of his burnt clothes fairly dropped off his body. Upon arrival at the house I found the back of his head, ears and side of face, entire circumference of neck, shoulders and entire area of back and both elbows fairly seared white from the excessively hot metal. There were also numerous small and large areas of superficial burns of chest, abdomen, hands, legs and feet; so all in all, there was fully two-thirds of the entire area of his body burnt. At that time not having the conveniences of a hospital, it was out of the question to resort to the continuous warm water bath, so resorted to the hot boric acid pads of gauze. Our greatest difficulty was keeping him in a com-

fortable bed, as it was out of the question for him to lie on his back and with considerable difficulty on his abdomen; so we took large rolls of cotton batting and built the bed up high and narrow in its center. Thus by keeping two such beds freshly made up and changing him from one to the other once to twice in twenty-four hours, he was kept fairly comfortable. The first four days we had great trouble with his bowels and stomach; tympany became at times alarming and was constantly being fought by the high turpentine emulsion enemas, but after the fifth day we had very little trouble with him. By constantly changing the hot boric acid gauze pads the wounds were kept perfectly clean, a little of the white, dead epithelial tissue coming away with each change of dressing, and the remarkable thing was the great rapidity with which the burnt area was replaced by normal epithelial covering, and this without having to resort to any skin grafting, for within a little less than four weeks the patient was walking around with only more or less red areas of skin, a little thinning of the ears, and a rather thick, red skin over both elbows to show for his frightful burns.

Discussion.

Dr. Morton, San Francisco: I have been very much interested in this paper. It is one of the best papers I have ever heard on the subject of burns and the technic. With regard to the picric acid I have been using it constantly for a number of years and have always felt afraid of poisoning. I remember one case in the City and County Hospital years ago which developed symptoms of poisoning. I am very glad to know that the doctor has had no trouble with his large burns.

Dr. Teass, closing: The length of time allotted to the reading of the paper would not permit me to touch upon the pathology of the subject, but to the clear understanding of the application of at least part of the treatment, it is essential that we think of the changes that take place in some of the tissues following extensive superficial burns. Notwithstanding the enormous progress made by our modern laboratory investigations, it is most interesting to note that, at least in this instance, they have served only to corroborate ideas arrived at from the accurate deductions of clinical observation. For instance, Long, a well-known English surgeon, as far back as 1840 stated that clinically, as from their complicated effect on the internal organs, burns closely resemble acute febrile diseases involving the skin. Most text books attribute death to thrombosis, but thrombosis occurs at times only in the capillaries and veins of the internal organs. According to the best article I was able to obtain on the subject, viz: "A Study of the Visceral Changes in Extensive Superficial Burns," by Charles R. Bardeen (from the Pathological Laboratory of the Johns Hopkins University and Hospital), there has come into view the idea that after burns there come into existence and circulate in the blood toxic substances which give rise to the constitutional symptoms. The blood is markedly altered; its specific gravity is slightly raised, the erythrosites are in part injured morphologically and functionally, and there is marked leukocytosis, chiefly of polymorphonuclear cells. Fragments of red blood corpuscles are collected in cells of the spleen, bone marrow and lymphatic glands; blood pigment is seen in the epithelium of the kidneys. The chief gross morbid changes are cloudy swelling of kidneys and liver, softened, enlarged spleen, and above all, swelling of the lymph glands and of the entire gastro-intestinal lymph follicles. Calvert found that a small arteriole runs to the center of each follicle in the lymph gland and here breaks up into capillaries which radiate out from the center and are collected into veins at the periphery of the follicle. The edematous swelling of the follicles is probably due to the plasma escaping with much more than the normal rapidity from the capillaries radiating from the central terminal artery. The violent necrosis of the lymphocytes may be ascribed to toxic substances in the plasma. These lesions of the lymphatic tissue are essentially like those found in the lymphatic glands of children whose death has resulted from diphtheria. Personally I have had very little opportunity of studying the visceral changes following extensive superficial burns, for I am happy to state that of all the varied cases of burns that have come under my personal care I have to record but one fatality, and that was during my first year of practice. A little tot some two years of age had fallen into a tub of hot water and was quite severely burned. I knew nothing of the treatment of burns then, so used the old carron oil treatment. The child died of toxemia. I feel quite confident that if I had a similar case to handle to-day it would in all probability recover.

DECAPSULATION OF KIDNEYS—CASE REPORT.*

By REXWALD BROWN, M. D., Santa Barbara, Cal.

Let me first place before you the case history:

Patient: Mrs. S. B. H., housewife, age 57. Kindly referred by Dr. H. L. Stambach, of Santa Barbara, in January of this year. Family history: Negative.

Personal history: a. Menstrual life ceased at 50 years of age; was always normal. b. No children; no miscarriages.

Previous illnesses: a. Scarlet fever, diphtheria and measles in childhood. b. Had attacks of migraine—headaches which vomiting relieved—from girlhood to the climacteric—they ceased at close of this period. c. When patient was 35 years of age, in 1886, she had attacks of severe crampy pain in left kidney region, often accompanied by vomiting. d. During the following year there were at intervals dull pains in left lumbar region and pain on urination—she often passed numbers of small stones—urine contained much pus. e. She was quite free from pain after this for two or three years; during this time she suffered a sunstroke, which compelled quiet for several months. f. In 1890 lumbar pains reappeared, and patient became a semi-invalid from continuous ache and soreness about left kidney. g. When 40 years old in the latter part of 1891, patient again suffered a very severe left lumbar colic, attended with vomiting, fever and collapse. She was confined to bed from December until the following March. Perinephritic abscesses developed, extending into loin and into left iliac fossa. A fistula opened through loin, discharging many stones; it healed in a couple of weeks. Following closure of first fistula, another opened above left iliac brim and discharged stones as large as peas, remaining open several weeks. Patient was told she could not live without operation, which she refused. In April and May patient began to get about on crutches.

Since 1892 there has not been a colic in left kidney region, though at no time has patient been free of a dull, dragging pain. Pus has appeared in urine at varying intervals.

Present trouble: In May of 1906, having undergone a severe strain for a year previous—illness of husband—patient consulted a Los Angeles surgeon because she had severe pain in left kidney, severe headaches had recently appeared, she had lost consciousness at times, and spots were appearing before eyes.

The right kidney was cut down on at that time and a letter from the surgeon said a modified Edebohl's operation had been done. Patient felt somewhat better after operation. The headaches were not so severe; spots before eyes grew more pronounced, however. In June, 1907, in Los Angeles, urine analysis showed—1000 c. c. examined:

* Read before the Southern California Medical Society, Santa Ana, Dec., 1908.